

GTL-203:

Modern Delivery Pipelines: GitLab CI, Helm, Kustomize, GitOps

Course Description: This training provides a comprehensive introduction to modern CI/CD practices and offers a deep, hands-on exploration of GitLab's CI/CD architecture. Participants will learn how to design, build, and operate GitLab pipelines – from foundational concepts to advanced, modular pipeline structures.

The course then extends into the cloud-native delivery ecosystem, where all tools and workflows are presented with a strong Kubernetes focus, including Helm, Kustomize, and GitOps operators such as Flux and ArgoCD. Release management is also covered through Kargo as an emerging, Kubernetes-native option. By the end of the training, participants will understand how these components fit together in real-world delivery workflows and will be able to build complete, production-ready CI/CD and GitOps pipelines.

Structure: The course combines concise theoretical explanations with extensive live demonstrations. All demo steps, commands, and configurations are provided so participants can fully reproduce every scenario on their own afterward.

Target audience: Developers, system administrators, and DevOps professionals who want to understand and apply GitLab CI/CD and GitOps workflows in cloud-native environments, and who aim to build reliable, automated delivery pipelines.

Prerequisites:

- Linux system administration basics
- Basic Git knowledge
- Experience in software development
- Basic understanding of Kubernetes

Duration: 3 days

Detailed Course Outline:

Module 1: The big picture

- Motivation behind CI/CD/CD
- Structure of a typical pipeline

Module 2: GitLab CI – Basics

- CI system generations
- Pipelines: structure & components
- Artifacts, containers, caching
- Triggers, deploys, environments

Module 3: GitLab CI – Advanced Methods

- Unit, module, integration tests
- Complex pipeline design
- Modular pipeline structure

Module 4: Helm – Kubernetes Packaging

- Charts: create & customize
- Hooks, templates, dependency management
- Helm vs. Kustomize

Module 5: Kustomize – Config Management

- Motivation & env-specific setups
- Generators, transformers, plugins
- Patches & Helm comparison

Module 6: GitOps Operators

- GitOps principles
- GitOps operators:
 - Flux, ArgoCD
- Repo structure & workflows
- Release management:
 - Kargo

Module 7: Complex scenario: GitOps in Action

- GitLab CI + Helm + Kustomize + Flux
- Release flow
- Full pipeline showcase